

CLAIMS

1. A process of producing a compound including:

(A) a reaction step of undergoing reaction in a reactor under a pressure higher than atmospheric pressure and at a boiling point at atmospheric pressure of a reaction medium or higher, to form a compound;

(B) a separation step of separating a fixed amount or more of the reaction medium from a slurry containing the compound and the reaction medium under a pressure higher than atmospheric pressure and at a temperature of a boiling point at atmospheric pressure of the reaction medium or higher in a separation device, to obtain a cake having a weight ratio of a cake-attached liquid of not more than 50 % based on the solids content; and

(C) a drying step of moving the resulting cake into a compound recovery zone having a pressure lower than the pressure in the separation device and a temperature lower than the temperature in the separation device, thereby evaporating the cake-attached liquid by internal energy released by the movement.

2. The process of producing a compound according to claim 1, wherein in the separation step (B), the cake is washed with a washing liquid having an evaporation latent heat at the boiling point at atmospheric pressure of not

more than 300 kcal/kg in a state in which the pressure is kept at higher than atmospheric pressure, and the temperature is kept at the boiling point at atmospheric pressure of the reaction medium or higher.

3. The process of producing a compound according to claim 1 or 2, wherein the reaction medium has an evaporation latent heat at the boiling point at atmospheric pressure of not more than 300 kcal/kg.

4. The process of producing a compound according to any one of claims 1 to 3, wherein in the separation step (B), the cake is washed with a washing liquid having a temperature in the range of the boiling point at atmospheric pressure of the washing liquid or higher but not higher than $(TB1 + 100 \text{ }^\circ\text{C})$ (wherein TB1 stands for the temperature ($^\circ\text{C}$) of an unwashed cake).

5. The process of producing a compound according to any one of claims 1 to 4, wherein in the separation step (B), the cake is washed with a washing liquid in an amount of from 0.03 to 5.0 times based on the weight of the solids content in the cake.

6. The process of producing a compound according to any one of claims 1 to 5, wherein the compound to be

formed in the reaction step (A) is an aromatic carboxylic acid.

7. The process of producing a compound according to claim 6, wherein the aromatic carboxylic acid is terephthalic acid.

8. The process of producing a compound according to claim 6, wherein in the reaction step (A), an alkyl group-substituted aromatic compound is subjected to liquid phase oxidation with molecular oxygen to obtain the aromatic carboxylic acid.

9. The process of producing a compound according to claim 7, wherein in the reaction step (A), p-xylene is subjected to liquid phase oxidation with molecular oxygen to obtain terephthalic acid.

10. The process of producing a compound according to any one of claims 1 to 9, wherein the reactions step (A) is carried out at a temperature in the range of from 50 °C to 350 °C.

11. The process of producing a compound according to any one of claims 1 to 10, wherein the reactions step (A) is carried out under a pressure in the range of exceeding

atmospheric pressure but not higher than 20 MPa.

12. The process of producing a compound according to any one of claims 1 to 11, wherein in the drying step (C), a difference between the temperature of the cake within the separation device and the temperature of the cake discharged into the compound recovery zone is from 5 °C to 250 °C.

13. The process of producing a compound according to any one of claims 1 to 12, wherein in the drying step (C), a difference between the pressure within the separation device and the pressure in the compound recovery zone is from 0.01 MPa to 22 MPa.

14. The process of producing a compound according to any one of claims 1 to 13, wherein in the drying step (C), the compound to be discharged has a median diameter of from 40 μm to 300 μm .

15. The process of producing a compound according to any one of claims 1 to 14, wherein in the drying step (C), a weight ratio of the cake-attached liquid is not more than 10 % based on the solids content.

16. The process of producing a compound according to

any one of claims 1 to 15, wherein in the drying step (C), a weight ratio of the cake-attached liquid is reduced by 3 % or more based on the solids content.

17. The process of producing a compound according to any one of claims 1 to 16, wherein in the drying step (C), an intermediate chamber is provided between the separation device and the compound recovery zone.

18. The process of producing a compound according to any one of claims 1 to 17, wherein in the drying step (C), a dry gas is introduced into the intermediate chamber and/or the compound recovery zone.

19. The process of producing a compound according to any one of claims 1 to 18, wherein in the drying step (C), the pressure in the compound recovery zone is atmospheric pressure.

20. The process of producing a compound according to any one of claims 1 to 19, wherein in the drying step (C), a pressure drying device provided with a discharge valve is used.

21. The process of producing a compound according to claim 20, wherein a contact portion between a valve body

and a valve seat of the discharge valve is linear, and its shape is circular.

22. The process of producing a compound according to claim 20 or 21, wherein in the drying step (C), the discharge valve is intermittently opened, and an opening time is from 0.01 seconds to 1 second.

23. The process of producing a compound according to any one of claims 1 to 22, wherein an intermediate processing step (D) for carrying out crystallization or dissolution of the compound is provided between the reaction step (A) and the separation step (B).

24. The process of producing a compound according to any one of claims 1 to 23, wherein in the reaction step (A), the formed compound is obtained as a solid.